CALIFORNIA
SEP 12 1958
STATE LIBRARY

THE Federal Accountant

VOLUME VIII SEPTEMBER 1958 NUMBER 1

Published by the Federal Government Accountants Association in co-operation with the Graduate School of Business and Public Administration, Cornell University, Ithaca, New York

THE Federal Accountant

PUBLISHED IN SEPTEMBER, DECEMBER, MARCH, AND JUNE
OF EACH FISCAL YEAR BY THE FEDERAL GOVERNMENT
ACCOUNTANTS ASSOCIATION IN CO-OPERATION WITH THE
GRADUATE SCHOOL OF BUSINESS AND PUBLIC ADMINISTRATION,
CORNELL UNIVERSITY, ITHACA, NEW YORK

VOLUME VIII, NUMBER I, SEPTEMBER 1958

Editors

Harold Bierman, Jr., Graduate School of Business
and Public Administration, Cornell University
H. Edward Breen, C.P.A., General Accounting Office
Herschel C. Walling, C.P.A., General Accounting Office

Editorial Committee

The Federal Government Accountants Association
Edwin J. B. Lewis, Bureau of Aeronautics, U.S. Navy, *Chairman*
Andrew Barr, Securities and Exchange Commission
Robert W. King, Housing and Home Finance Agency
E. H. Morse, Jr., General Accounting Office
Lindsley H. Noble, Post Office Department
Carl W. Tiller, Bureau of the Budget

Advisory Board

Graduate School of Business and Public Administration,
Cornell University
C. Stewart Sheppard, *Dean*

Joseph E. Hampton
A. Miller Hillhouse
John G. B. Hutchins
Arthur E. Nilsson
David A. Thomas
Paul P. Van Riper

Annual subscription is $4.00; single copies may be obtained for $1.25 per issue. Make checks payable to The Federal Government Accountants Association and send to: Martin C. Powers, THE FEDERAL ACCOUNTANT, 1523 L. St., N.W., Washington 5, D.C.

©1958 by The Federal Government Accountants Association. Second-class mailing privileges authorized at Washington, D.C.

Contents

Articles

Improving Federal Budget Procedures..*Percival F. Brundage* 3

The Challenge of Managerial Accounting.....*E. W. Gaynor* 9

Practical Improvements in Audit Testing..*Milton A. Schwartz and Louis N. Teitelbaum* 20

Expanding Role of the Accountant.....*John L. Carey* 35

Departments

Technical Accounting Developments....*Herschel C. Walling* 50

Book Reviews.....*Clark L. Simpson and Leo Herbert* 55

Current Publications.....*H. Edward Breen* 58

The editors invite the submission of articles, discussions, research reports, correspondence, conference and other news items, and reviews of books and documents. Address manuscripts and other matters involving editorial policy to: The Editors, THE FEDERAL ACCOUNTANT, at either 1523 L St., N.W., Washington 5, D.C., or the Graduate School of Business and Public Administration, Cornell University, Ithaca, New York.

Opinions or beliefs set forth in articles, editorials, or other matter in this publication are those of the respective authors; they are not necessarily shared by the Federal Government Accountants Association or the Graduate School of Business and Public Administration, Cornell University.

Percival F. Brundage

Improving Federal Budget Procedures

Control of federal government expenditures and financial management practices have been strengthened in recent years, but there are several areas in which further changes have been proposed. One of these is the stating of appropriations on an annual accrued expenditure basis. This would limit the amount of goods and services which may be received by an agency in a year and would result in an annual review of available appropriation balances held by the agencies. Other proposals include an item veto for the President, the establishment of a joint congressional committee on the budget, and the extension of control procedures to cover expenditures which are currently outside the control of the annual budget.

Mr. Brundage was until recently the Director of the Bureau of the Budget.

IN our form of government the annual budget is a joint product of the executive and the legislative branches. It involves both the planning and administrative responsibilities of the President and the constitutional financing authority of the Congress. It should be recognized that the annual budget document represents more than a submission of future plans, although that is its principal purpose. It also reports the actual budget results for the immediately preceding fiscal year and contains revised estimates for the fiscal year then current. Thus, the budget each year serves several

purposes—it outlines the size, scope, and financial requirements of the programs the President proposes to meet national needs in the fiscal year ahead; and it serves as a report to the Congress of the financial stewardship of the executive branch.

Control of expenditures and improvement of financial management practices are both problems of major magnitude and require continuous effort. As a result of the budget and accounting recommendations of the second Commission on Organization of the Executive Branch of the Government (the second Hoover Commission), the Bureau of the Budget has in recent years strengthened the staff handling this important part of its total responsibility.

Under the Joint Program for Improvement of Accounting, the Bureau of the Budget, the General Accounting Office, and the Treasury Department have been working closely with the various executive agencies in improving their financial management. This is being done in accordance with the Hoover Commission recommendations and Public Law 863, which provided legislative support for their joint improvement efforts.

A Bureau of the Budget bulletin and the pamphlet "Improvement of Financial Management in the Federal Government" were sent to each federal department and agency, and considerable progress has already been made toward the objectives sought. In some agencies all that is now required is the refinement of the existing procedures. In others, particularly Defense, it will take a number of years to achieve the desired objectives.

Systems as they are being developed by the agencies under this government-wide program incorporate obligation and cost controls and provide for current reports which will enable better accounting for the cost of work performed and better planning programs.

ANNUAL ACCRUED EXPENDITURES

Another recommendation of the Hoover Commission in the budget and accounting field was that the Congress appropriate funds in terms of annual accrued expenditures. Under the Commission's proposal, appropriations would be on an annual basis and would provide funds to cover the cost of goods and services to

be received in the budget year. Unused appropriations would lapse at the end of the year except for the amount necessary to cover accounts payable for goods and services received but not yet paid for. In addition, the Commission pointed out that the agencies with long lead-time programs would need authority to contract in the budget year for future deliveries of goods and services.

The important feature of the proposed procedure was that both the Congress and the executive branch would conduct a more systematic review of agency programs on an annual basis, and this would be done from the standpoint of costs and accomplishments. Attention would be focused on the work to be performed in the budget year and on the estimated cost of the work, and would thus afford better control of expenditures for agency programs. Since the budget surplus or deficit is based on expenditures rather than appropriated amounts, this change in the appropriating procedure would also provide a closer relationship between congressional appropriations and the surplus or deficit for the year.

Legislation to give effect to this Hoover Commission recommendation was passed unanimously by the Senate in both the Eighty-fourth and Eighty-fifth Congresses. In the first session of the Eighty-fifth Congress, a companion measure was approved by the House Government Operations Committee. Strong opposition developed in the House, however, to the contemplated use of "contract authority" as part of the appropriation procedure. In March 1958 the House passed legislation with an amendment which eliminated the use of "contract authority."

The amended bill approved by the House substantially carries out the recommendation of the Hoover Commission. Under this legislation, appropriations will continue to be made on the same basis as at present with the additional requirement that each appropriation supported by an accrual accounting system will include a limitation on annual accrued expenditures. Appropriations, therefore, would continue to provide authority to incur obligations for goods and services and to make the related payments. However, the use of this authority would be governed by the new annual accrued expenditure limitation, which would specify the amount of goods and services that could be received under the appropriation in the budget year. Goods received but not paid

for during that fiscal year (accounts payable) could be paid from the appropriation without further congressional action—provided this did not cause the limitation to be exceeded. Any unused balance of the limitation on annual accrued expenditures would lapse at the end of the fiscal year concerned. Goods and services ordered during one fiscal year but received during a subsequent year could be paid from the appropriation against which the obligation was incurred, but only if it was within the annual accrued expenditure limitation established by the Congress for the subsequent year in which the goods were received.

The accrued expenditure limitation feature would concentrate attention on the cost of programs planned for the budget year and would require systematic annual review of such programs and their financing. This means that through the budget review process there would be an annual review of available appropriation balances in the hands of the agencies. This would also enable Congress and the executive branch better to control the use of such available balances.

This legislation, if finally enacted, will be implemented on an evolutionary basis. A prerequisite to presentation of appropriation requests that include an annual accrued expenditure limitation is the installation and use of accrual accounting systems by the individual agencies. Work toward this objective is now well under way as an important part of the financial management improvement effort under the Joint Accounting Program.

THE ITEM VETO

Another important improvement has been recommended by the Bureau of the Budget—the item veto. Most state governors have this authority, which can be a very useful tool in protecting the taxpayer against the improvident expenditure of government funds.

The item veto would be an effective weapon for economy. Legislation enacted to provide for such a veto should grant authority to veto legislative provisions as well as appropriation items. It should also include authority to reduce appropriations, but only to the extent necessary to permit the disapproval of amounts added by the Congress for unbudgeted programs or projects, or of increases by Congress of amounts included in the budget.

The need for an item veto was clearly illustrated last year. In approving the 1958 Public Works Appropriation Act, the President indicated his deep concern about the large financial commitments represented by the unbudgeted new construction starts for the Corps of Engineers which the Congress had added to the bill. He pointed out that this was "the third successive year in which this has happened, with the result that future financial commitments of the Federal Government have increased about $2.5 billion in that period, most of which must be appropriated over the next 3 to 5 years if these projects are to proceed." If the President had possessed the power to veto individual items, substantial reductions in appropriations would have been possible with a resultant saving to the American taxpayer.

OTHER PROPOSALS

Other legislative proposals have been made which involve changes in congressional procedures during the budget process. Of course, the Congress itself will determine its own procedural arrangements for handling appropriation requests. Two of the proposals considered in the Eighty-fifth Congress, however, illustrate the nature of some of the procedural problems involved in achieving greater budgetary control.

Bills were introduced in both the Senate and the House to establish a Joint Committee on the Budget in the Congress. The purpose of this legislation was to enable a more informed joint review of the budget proposals transmitted by the President and thus to assist the Congress in exercising more adequate control over government expenditures.

Another related proposal was a concurrent resolution introduced in the Senate to authorize use of a consolidated appropriation bill. The objective of this resolution was to provide a procedure for considered attention to total appropriation requests in relation to anticipated revenues. It also was directed toward establishing more stringent control over available carry-overs and expenditures by providing that each appropriation item include an annual limitation on expenditures.

In this connection, there is one financial management problem that has not yet reached the proposal stage, but was recognized in a report issued by a special House Appropriations subcommittee

during the first session of the Eighty-fifth Congress. In that report, the subcommittee pointed out that at present the annual congressional review of appropriation requests provides only a limited basis for Congress to exercise its will on total government spending. This is true because a substantial amount of new obligational and spending authority is made available through such financing devices as permanent appropriations, authorizations to expend from public debt receipts, permanent contract authorizations, and specified formulas established in basic legislation for various grant-in-aid and other programs. The subcommittee noted that this is a growing practice and that the Congress cannot permit this development to continue without seriously impairing its exercise of effective control of the purse.

CONCLUSION

The improvement of financial management in the federal government is a continuous process and good progress has been made. In the 1959 budget, for example, there was a net increase of 52 cost-based appropriation requests. This makes a total of 98 such presentations, the use of which reflects agency installation of the financial management practices required under Public Law 863. According to the schedules of the agency improvement plans, there should be a comparable increase in this respect in the next budget. This is a significant advance, when one considers that the budget for fiscal year 1957 presented only four cost-based appropriation requests.

Considerable educational work still needs to be done not only in the executive departments but also in the Congress and outside. Any system of accounting management and control is effective only to the extent that it is intelligently used. However, there are in positions of executive responsibility men with the training and business experience which I believe will enable them to operate the new system effectively.

E. W. Gaynor

The Challenge of Managerial Accounting

Despite the growth of both human and mechanical resources devoted to processing accounting data, the complaint persists that there is a lack of operating information. Much of the accounting data currently being produced is subject to the criticisms of inadequacy and lack of timeliness. Too often reports are more or less accidental results of the accounting system, rather than the end objective for which the system should be designed.

The advent of high-speed data-processing equipment has opened up the possibility of using large amounts of information not readily available in the past. Effective utilization of this potential requires a careful analysis of the accounting system in light of management's needs and desires.

Mr. Gaynor is on the Controller's staff of Chrysler Corporation.

"LET'S get our reports out faster," or, "We need more information about our operations." With some variations the problem of reporting appears to be one of the major problems of every manager responsible for the results of an organized activity. With varying degrees of success the challenge has been met by batteries of analysts, cost clerks, and equipment that is capable of producing printed forms and reports in an almost unbelievable volume. Yet the problem seems to persist. We produce mechanically or electronically more words and figures, faster and in a greater number of

copies than ever before, but do we develop more or better information?

It is true that, where high-speed and high-cost electronic or mechanical equipment has been installed, considerable improvement has been noted. Much of this improvement, however, must be attributed to the detailed analysis and research that must be performed prior to the installation of such equipment. For the first time management and accounting systems are being placed under the cold, critical gaze of scientific analysis. Reports are being analyzed as the end product of the accounting information system. Systems are being redesigned to produce the desired information. Principles concerning "feed back" long known to engineers are being applied to management needs. However, in a large number of organizations, both government and commercial, where such equipment has not been installed and thus no searching analysis performed, the reporting function is still somewhat less than ideal. This is unfortunate, because even manual bookkeeping can be considerably improved by the proper organization of work. It is to these situations that we turn our attention.

THE PROBLEM

Review of the situation reveals that our problem involves two aspects—the type and amount of information that is or could be produced and the speed with which it is or might be supplied. Of the two the first is more important, as there is little value in considering speed until we know exactly what we wish to produce.

Starting with fundamentals, information, both historical and forecast, is our product. The tool or medium which is to provide this information in our field of interest is the accounting system and a related system of controls and records. It is almost too academic to mention, but if we use the wrong tool or one improperly designed for the task, we can scarcely hope to accomplish our objective. Results seem to indicate, however, that this is the point at which much of our trouble lies. We would not build a plant, equip it with the latest devices and equipment, hire a staff, and then just hope that we could produce some useful product. Using such an approach, we would be considered quite naïve and somewhat lacking in business judgment. Yet in more cases than we

would like to admit, this is exactly what has happened with our accounting systems. Our reports are accidental results of the accounting system rather than the object for which the accounting system was designed. Not enough emphasis has been placed on the results that are expected or required by management. Perhaps too much emphasis has been placed on the technology of the system and too little attention given to its real purpose.

Before exploring the steps that might be taken to alleviate the situation, let us consider two somewhat independent and yet related concepts: (i) the concept of work and (ii) the concept of the mathematical model.

TOOLS vs LOGIC

For many years, awed by the wonders of mass production, we believed that production results from the application of tools to materials. We were imbued with the assembly line idea that a new car is the result of applying wrenches of various sizes to a series of component parts. Whether it was reports or airplanes, we considered the production process in terms of the tools, equipment, and gadgets used to produce the end product. Our horizon was limited because we did not look beyond the material objects before us. We ignored the basic principles underlying the production system. We ignored the organization of work. In financial management we must overcome the presence of almost infinite detail; we must be brief and accurate, we must report on time, and, last but not least, we must know what to report. The application of a little logic to this task could certainly help us. This concept of applying logic to work presupposes that someone is capable of understanding the specific production system required and the principles that underlie its operation. It would follow then that to produce a given type of information in a prescribed form we should have a system or process designed with a particular objective in mind. Thus, the same accounting system (our production system) may not be capable of producing adequate information to (i) keep management informed for planning and controlling operations, (ii) provide the tax or budget departments with proper information, and (iii) provide information to the government, stockholders, employees, and other interested parties. Each of these

groups has very specific requirements in terms of substance, method of presentation, and timing. While the original data for all of these reporting requirements is substantially the same, the process through which it must pass to produce the desired end product may differ significantly. In factory operations we would not put a piece of metal from which we intended to make a rivet through the identical process that we would if we desired to make a lipstick container. Part of the process might be the same or similar, but certainly not the entire process.

Why then should we so limit our horizon in accounting? Probably because by tradition accounting and reporting have often been considered "necessary evils" and completely unproductive. They may have started out that way, but today nothing is farther from the truth. Modern management, because of its very nature, requires a great deal of accurate information for proper planning and control. Information is the basis for managerial judgments and decisions. Without it most managers would be helpless. Only when this information is erroneous, misleading, unnecessary, or too much and too late does it become a burden. To overcome this situation, it will be necessary to analyze not what we have but what we need.

THE MATHEMATICAL MODEL

The entrance of scientific methods in the field of business has brought a great many ideas and concepts previously not used in business management. From the point of view of our subject matter, one of the more important of these is the concept of the mathematical model. This term is applied to a mathematical description that presents in condensed yet understandable terms the relationships that appear to be measurable in a given situation. The model can be designed so that it represents a situation during a period or at a point in time. Unfortunately, as accountants, many of us have failed to realize that we have within our control and comprehension one of the most elaborate mathematical models that man has attempted to design.

It would appear that on too many occasions we forget the purpose of the accounting system, and we fail to recognize what an accounting system really represents. It is true that during the years we have designed and redesigned many of our accounting systems. But rarely has a scientific approach, such as is inherent in the con-

struction of a mathematical model, been employed. Much of our previous design and redesign effort has been merely for the purpose of incorporating gimmicks or gadgets into our system. LIFO, FIFO, NIFO, declining balance, sum of the years digits, replacement cost, and many others have left their imprints. In the direst of emergencies new reporting requirements have been saddled on the existing systems, which are completely unsuited to the new requirements. Practices such as these are scarcely in harmony with the dynamic nature of management as we understand it today.

The construction of the model or accounting system is in the final analysis nothing more than the application of logic to work. The accounts and their relationship with each other should be a model of the organization we are trying to portray. The statements and reports they produce are the result of solving many rather complicated business equations, at least all those that can be expressed quantitatively.

A POSSIBLE SOLUTION

Probably we could not have seen the problem area as clearly ten years ago as we can today, since we did not have, or were not aware of, the thinking and the technical methods that are available to us now. But the advent of high-speed electronic equipment has spurred development to the point where some feasible solutions suggest themselves. The solutions proposed fall into two general areas: (i) a suggestion for the logical redesign of our mathematical model, i.e., the accounting system, and (ii) the application of statistical techniques in gathering and processing data for periodic reporting.

DESIGN OF THE ACCOUNTING SYSTEM

The advent of the electronic computer is not merely an advancement in office hardware but a major step in the evolution of the management concept. It took a major advance such as this to crystallize the principles of the process involved in the production of information. As a result, much of the instruction in the use of electronic systems introduces the student to the subject with the following chart.

Input——Process——Output

The input is the information generated by operations. The process

is the action of the accounting system or another system on this information. The output represents the resulting reports, invoices, statements, and the like that are generated by the process. This schematic representation is as valid in its application to the processing carried out by a million-dollar computer as it is to the work of a bookkeeping clerk posting manually the accounts of a small enterprise. It represents fully the physical cycle involved in the gathering, processing, and dissemination of information.

This entire operation can be further subdivided into small segments, classified somewhat as follows: information gathering, information recording, information transmission, information preparation or editing, information processing, and information output or report preparation. To date, a great deal of our attention has been devoted to the processing phase, i.e., methods and tools have been devised which permit us to process the information at ever increasing speed. In fact we produce reports at a rate that is considerably in excess of management's reading speed. As stated previously, what is needed in a given situation, however, is to approach the problem not in terms of the process involved but from the standpoint of the output. *What information or reports does management need?* Not until this is determined can the process, as well as the method, of gathering the information be fully developed. By information we mean all types of reports required by management to control an organization. They include the operating statements, balance sheet, special product cost statements, income tax returns, invoices, production reports, and all the other special but recurring bits of information that management requires. One word of caution concerning the needs of management: the accountant, i.e., the information gatherer, processor, and interpreter is not necessarily the logical individual to determine management's needs. Because each manager operates in a manner peculiar to and fitting his personality and experience, and since he is ultimately held responsible for the success or failure of the operation, he must determine his information requirements. The personnel providing the information can advise what is available and what can be developed; they have a duty to interpret the information presented and are obligated to recognize danger signs in all areas whether or not they are included in the formal reporting system. They must

teach and demonstrate the use and application of the information developed. But the ultimate responsibility for setting specific reporting requirements must rest with the responsible individual —the manager.

Table 1 presents an analysis of all the possible transactions that could take place in the several inventory accounts of a hypothetical enterprise. In normal accounting procedures, each of these 27

Table 1. Analysis of inventory transactions

Type of transaction	Inventory				
			In process		
	Raw material	Component parts	Raw material	Component parts	Finished goods
Additions through					
Purchase	xxx	xxx			
Use			xxx	xxx	
Completion of product					xxx
Returns from customers					xxx
Reductions through					
Use	xxx	xxx			
Completion of product			xxx	xxx	
Scrap			xxx	xxx	
Discovery of defects	xxx	xxx			
Sales					xxx
Price adjustments	xxx	xxx	xxx	xxx	xxx
Write-off of obsolete stock	xxx	xxx	xxx	xxx	xxx
Returns to vendors	xxx	xxx			

transactions would be posted as a debit or credit to one or several inventory accounts, and at the end of the month the accounts would show the balance in each. The income account would likewise reflect the net impact of these transactions on the month's earnings. However, information in this form satisfies but one of the reporting requirements—preparation of the balance sheet and

operating statement. It is doubtful whether this is management's most important requirement. Operating executives such as the vice president in charge of production, the plant manager, and others require a detailed analysis of all or selected inventory accounts if they are to carry out their responsibilities. They must know what took place and why. Would it not be more logical to design the accounting system—the mathematical model, if you like—so as to gather and process information in the form that more fully meets these requirements? Since the reporting system requires an analysis by transaction, why not accumulate the information in this manner in the first place.

In any event, we shall have 12 different types of transactions to record. At one extreme only 5 accounts are involved, at the other 27, i.e., a separate account for each type of inventory transaction. After all, this information arises only because separate and distinct transactions, operations, or events take place.

If operations are to be described as they take place, the individual transactions by type should be revealed rather than submerged in a month-end inventory balance. A month-end balance may be meaningful from a balance sheet or even an operating statement standpoint. But from the point of view of management's necessity to control operations, it is much more meaningful to know that the decrease in "inventory component parts" was caused primarily by write off of obsolete parts, return of defective parts to vendors, or any other causes or combination of causes. This is sometimes called accounting by transaction (the alternative is variance analysis). It is not new but is quite adaptable to the solution of many reporting problems. It makes the accounting system a tool for continuous analysis of events as they take place, operating on the well established premise that efficiency is best served by handling a given item as little as possible, preferably once.

We must make a choice between two possible efficiencies. Either we minimize the posting effort and maximize the analysis required, or we increase our initial posting requirements and decrease our analysis problem. In terms of effective cost reduction, the latter course seems more rewarding in many situations. Where all reporting requirements do not require such detailed analysis, the

elements may be synthesized to whatever extent necessary. Adding several items is always easier than reaching into a large mass of data and dividing or sorting it into its component parts. Accounting by transaction provides for a continuous sorting of the information as it is gathered and processed rather than allowing the whole job to lie dormant till the end of the accounting period. It also permits the analyst to devote his time to the study of cause and effect rather than inefficiently performing a sorting operation. In the case described it would have provided by direct processing of data the detailed information required by various segments of the organization. For purposes of the operating statement, we would have merely combined the several transactions into single amounts —a much faster operation than making all the entries to a few accounts and then analyzing them in detail at the end of the period. We could follow substantially the same procedure for any element of information that normally arises from or for several different transactions, operations, sources, purposes, objectives, or any other classification factor.

Companies that have used this concept or some modification of it have noted substantial improvement both in the information reported and the speed with which it is available. It may increase the number of accounts, but it decreases the amount of month-end analysis.

STATISTICAL APPLICATIONS

In situations where information is not or cannot be gathered and processed in a manner similar to that described in the previous paragraphs, we can resort to certan statistical and mathematical techniques in order to reduce the amount of data that must be processed in detail for specific reporting requirements. Admittedly this approach may not give us the exact answer, but neither does historical accounting. It will as a rule, however, provide one that is sufficiently accurate within prescribed ranges. Aging of accounts receivable, computation of labor efficiency, determination and analysis of variances, computation of expected machine down time, and developing information to determine the adequacy of stand-by machine maintenance crews are only a few of the many areas in which these methods can be profitably used. They are

extremely useful in situations where we wish to complete the reporting requirements before fully completing the bookkeeping operations for a given period. Even with high-speed processing devices, these techniques might be used in order to free the equipment for other operations.

No attempt will be made here to describe and discuss the statistical method that should be employed. The area is too great and specific applications too varied for such a general discussion. A few techniques that have found management acceptance, however, will be mentioned and general areas of application suggested.

Control charts, a basic technique of quality control, provide an excellent medium for reporting by exception on such elements as labor efficiency, machine down time, and control of specific cost elements, programs, or operations.

Correlation technique is quite suitable for developing the validity of relationships between cost elements, operations, profits, sales, and many other business operations. Where valid relationships are evident they may be used as the basis for forecasting the incidence of some event, cost, or situation. The value of forecasting need not be discussed here, as it is generally agreed that for management purposes a fairly good estimate is worth infinitely more than a very exact historical account. Where this technique can be used, we can really report to management before our bookkeeping operations are complete. Correlation technique and related forecasting methods can be well adapted to forecasting sales, inventory levels, absenteeism, open accounts receivable, cash requirements, cost, determining location of plants, branches, offices, or stores, as well as many other elements of desired information.

Statistical sampling technique which involves samples with defined risks and probabilities can be used for the aging of accounts receivable, analysis of special accounts or operational areas, determining the composition of large and complex inventories, and developing reorder points and economic quantities in inventory control.

Queuing theory and its techniques are suitable for determining the adequacy of stand-by repair crews, adequacy of service centers, rate of processing or service, and the like. Other applications can be developed through research and use. Each within limits is cap-

able of reducing the amount of work and time required to develop necessary information.

GENERAL CONSIDERATIONS

Our discussion has admittedly been somewhat critical. It was intended to be so. We are no longer matching wits with accountants only. Physicists, biologists, anthropologists, mathematicians, and other scientific minds are entering the business and government fields. Each contributes the benefit of a particular brand of scientific discipline. They all, however, have one thing in common. They approach problems in a cold, critical, impartial way. They analyze to the minutest segments and synthesize the whole. This type of critical, impartial analysis is necessary to improve the process for whose design and operation accountants are responsible. We have tried to emphasize that from management's point of view the accounting system is the device used to gather, process, and disseminate information. It should be designed not in terms of requirements suitable for only a small segment of report recipients, or to propagate professional principles of the designers, but it should be designed and maintained with management's needs as the primary objective. Perhaps to accomplish this we must learn new skills or at least be capable of understanding them and allowing others to use them. At any rate we must recognize the ever-changing pattern of management requirements and develop methods to meet these new demands.

Milton A. Schwartz and *Louis N. Teitelbaum*

Practical Improvements in Audit Testing

Statistical sampling is being used to an increasing extent by auditors in government and in business. This growth has been accompanied by a shift in emphasis from the widely used subjective sampling procedure, sometimes called "judgment" sampling, to the more objective statistical or scientific sampling. The latter method leads to more uniform and meaningful results based on samples which are small and thus economical. It has been found that larger installations do not require significantly more time and personnel than smaller installations when statistical sampling has been employed.

Mr. Schwartz is a Mathematical Statistician in the Plans and Programs Division, and Mr. Teitelbaum is Chief of the Plans and Programs Division, Headquarters, Auditor General, United States Air Force.

IN government and private business, internal auditors provide top management with information for many of the decisions which affect financial as well as operating policies and actions. Since audit reports containing factual data and recommendations are the means by which the auditor talks to management, he must be sure that management never has reason to lose faith in his reports. To this end, he must maintain high standards of thoroughness and accuracy and provide valid and reliable information in the shortest possible time.

A previous article[1] sought to establish that statistical sampling methods are useful and advantageous to the auditor in government, in public accounting, and in commercial auditing. Since 1954, the Auditor General organization of the United States Air Force has been testing and applying these techniques to an increasing number of audit areas. These applications are demonstrating the utility and versatility of this powerful tool, which is at the disposal of auditors and accountants.

Of course, sampling is not a new concept to auditors. We have been "test-checking," or "sampling" for many years. Indeed, it is to the credit of the accounting profession that its members were among the first to recognize the need and value of sampling and to introduce it directly into their normal audit procedures. Many steps in the usual audit program involve a test of a "selected number of transactions." Although we consider our present judgment sampling methods as adequate, we have no practical way to evaluate them. In the light of our present knowledge of scientific sampling, we would be shortsighted if we did not investigate means of improving our procedures so that we can evaluate our sampling methods and results objectively.

Statistical sampling is being tested and is being used to an increasing extent by auditors in government and in business. Interest in this tool is spreading rapidly, as indicated by the growing volume of books and articles being published on the subject for the accounting profession.

This growing interest in sampling is characterized by a shift in emphasis from our present subjective sampling procedure, sometimes called "judgment" sampling, to the more objective sampling approach, namely, statistical or scientific sampling.

Similarities between Subjective and Objective Sampling

There are, of course, a number of major differences between judgment sampling and scientific sampling. However, notwithstanding these differences or the shift in emphasis which is taking place, it is important to remember that there are a number of striking similarities, particularly in some of the underlying prin-

[1]W. P. Farnsworth and L. N. Teitelbaum, "Can Auditors Use Statistical Sampling Methods?" *Federal Accountant*, June 1957, pp. 17–28.

ciples. The auditor's reasons for sampling and criteria for good samples are in most cases identical with those accepted by statisticians. For example, the auditor samples because he wants more timely information; he samples for economy of audit operation, and he often samples for increased accuracy of audit results.

As for the criteria of a good sample, the auditor knows that a good sample is one that is representative of the whole from which it is selected. If it were otherwise, he would not be in a position to draw inferences about the whole based on the sample information. A good sample must provide elements that are capable of complete and exhaustive examination. A good sample must include a sufficient number of items to give adequate results, or, in statistical language, within acceptable degrees of "precision and reliability." The significance of these similarities between judgment and objective sampling is that in order to study and apply statistical sampling techniques, the auditor does *not* have to start from scratch.

How Many Items Shall We Check?

Auditors know intuitively that the number of items checked is important. The more items they check, the more confident they are of the results. But the maximum number of items drawn for examination is usually determined by balancing the cost of auditing the group of items against the value of the information which might be obtained.

It also has been customary for auditors to select a fixed percentage of the total number of items under examination (universe) on the assumption that the sample size varies proportionately to universe size.

Statisticians, however, have demonstrated that the size of the universe is relatively unimportant when determining sample size. For example, under a given set of conditions the sample size for a universe of 5,000 is 357; under the same conditions, for a universe of 50,000 the sample size is 381; and for an extremely large or "infinite" universe, the sample size is 384. Thus, samples of a fixed percentage to the total may result in under sampling from small universes, or oversampling from large universes. Samples that are too small may give inaccurate results; samples that are too large are unnecessarily costly.

Statisticians also have shown that it is possible to determine in *advance* the number of items that should be examined to produce results that auditors are willing to rely on. This provides a positive and objective answer to the question, "How much testing is enough?" In addition, they have devised various methods of drawing unbiased or random samples, thus, in effect, giving a high degree of assurance that the samples are "representative."

We in the Air Force have acquired some valuable experience as the result of a series of audits we performed at air bases during 1956–1957. In all of these audits we found that our ability to express the sample results quantitatively and qualitatively, that is, in meaningful figures as well as in words, enabled us to evaluate the operations audited at each installation more definitely and objectively, to compare the audit results among all the installations, and to measure the quality of the operations on an over-all basis. In other words, we had a uniform common denominator and definite measuring sticks instead of relying on words such as "satisfactory" or "unsatisfactory." As one British statistician has so aptly said, "It is always useful when we can measure things on a ruler instead of simply calling them 'big' or 'small.' "[2]

Continued Study and Testing Is Necessary

Of course, we still have many problems to overcome, some of which are peculiar to auditing. The accounting profession must study, test, and develop statistical methods best suited for its special needs and conditions. And this is exactly what we are doing. We are currently studying, testing, and using different sampling approaches, namely, survey sampling, acceptance sampling, and what we call "exploratory" sampling.

Any program for designing and adapting statistical methods for use in auditing must take into account basic audit purposes. The primary objectives of the auditor are to *evaluate* through sampling the *quality* of the accounting records and the adequacy of the internal control system. The frequency of occurrence of errors, or failure to follow prescribed procedures, is an important measure of such quality. If the auditor's tests indicate trouble, he must analyze the nature and impact of the deficiencies, determine their cause, and if necessary enlarge his examination. Furthermore, auditors

[2]M. J. Moroney, *Facts from Figures* (London, 1956), p. 2.

deal largely with financial data and are concerned with the *dollar error* in the accounts, as well as with the *number* and *type* of transactions in error.

Survey Sampling Most Useful Now

In view of the auditor's special needs and objectives, our studies and similar studies by other accountants and statisticians point to survey sampling (i.e., sampling for estimation purposes) as being most generally useful at the present time. This approach uses general sampling theory and techniques as a more promising and practical approach to evaluation of audit areas rather than the specialized "acceptance sampling" techniques used in the inspection of production line products.

The survey sampling method permits the auditor to estimate the value or quality of one or more characteristics of the larger group with only one sample. He also can measure the adequacy of his single sample as well as the risk that the sample results may not be representative. In addition, he can relate the findings revealed by examination of the sample to his over-all review and knowledge of the accounting system and internal controls, and then form a final opinion as to the quality of the system and records.

Another Useful Method—Exploratory Sampling

Under certain conditions, a somewhat different situation confronts the auditor. His tests may be directed toward locating *examples* of certain types of serious *irregularities,* such as failures to adhere to basic internal control procedures or evidences of manipulations and possible fraud. In such circumstances another variation in sampling approach, exploratory sampling, seems more appropriate. By use of random sampling methods and proper sample sizes, this approach provides any desired degree of assurance that the auditor will find at least one example of the type of irregularity in question, provided it occurs in the universe with a specified frequency. The auditor does not need to know how to calculate mathematically the sample sizes—tables have been prepared which will give him the sample required under the conditions he specifies. For example, if a certain serious irregularity occurs in 10 transactions out of a total of 1,000, a sample of 200,

randomly selected, will give almost a 90 per cent probability of finding at *least one* such irregularity. Since the sample sizes given in the tables are maximum sizes, the disclosure of at least one irregularity may occur at any point in the testing process; at that point, the auditor may, if he wishes, stop his test-checking and investigate the circumstances. If, however, he completes testing of the entire sample without disclosing any errors, he may interpret that to mean there is a high probability (almost 90 chances in 100) either that there are no such irregularities, or that they occur less often than 10 times in 1,000.[3] Potentially, this approach appears to have many uses in various types of audit examination, and we are already using it in some of our work. Actually, this method is a variation of an "acceptance sampling" approach. However, when one or more serious irregularities are disclosed by this method, this serves only as a warning that further testing and investigation may be required (as in case of fraud).

Why Random Sampling?

The term "random sampling" has been mentioned two or three times. Why is random sampling so important? Random selection is the lifeblood of the scientific sampling process. Without *randomness* in selecting samples, the desired objectivity, measuring the reliability and accuracy of the sample, making inferences from the sample to the whole, and justifying the results on a scientific basis are not possible. Only when sampling is truly random will the mathematical laws of probability apply. Selecting items randomly provides the means of eliminating personal bias or subjective considerations, conscious or subconscious, from the choice of samples.

Random sampling is defined as a selection process in which each unit of a total group (or universe) from which the selection is being made has a determinate chance or probability of being selected. For example, in selecting at random one document or item from a group of ten such documents, we do so with the firm knowledge that the probability that any specific item will be selected is one chance in ten, or 1/10th. This probability is known because the

[3]Herbert Arkin, "Statistical Sampling in Auditing," *New York Certified Public Accountant*, July 1957. Tables of probabilities and associated sample sizes are included in this article.

only factor involved in random selection is the element of chance. In short, if we use random selection methods properly, we have a better chance of obtaining a representative sample.

A CASE STUDY—AUDIT OF SHIPPING FUNCTION

The full significance of statistical sampling methods becomes more apparent and meaningful when examined in action. An excellent illustration of the practical use of statistical sampling was an audit of the shipping function at Air Force depots performed in 1957. Accordingly, we shall discuss this experience in some detail in the hope that the reader may be able to find comparable areas of application in his own work.

Audit Objective

Care was taken to define the audit objective clearly and specifically for participating field auditors. This objective was to determine the efficiency of off-base shipment operations at each of the major depots during the most recent and complete month of operations (in this instance, February 1957). Off-base shipments refer only to shipments of supplies and equipment to locations other than the one at which the depot is located.

Reasons for Selecting This Area for Audit

There were a number of significant and practical reasons for selecting the area of off-base shipments as the area for a statistical sampling application.

1. Depots are at the heart of the vital Air Force supply system. The success of supply (logistic) operations depends greatly upon the efficiency with which the depots conduct their operations.

2. Supply operations are normally subject to audit. Thus, we simply substituted the objective methods and criteria of statistical sampling in place of the more subjective techniques which would have been used.

3. The large number of documents involved makes the use of test-checking (sampling) mandatory.

4. There is comparative homogeneity of operating procedures and record-keeping systems at depots. This had the twofold advantage of permitting uniform instructions and producing uniform results. This homogeneity was especially significant because it pro-

vided a sound basis for comparative evaluations between depots as well as a consolidation of data from all depots in an over-all summary report.

5. This area lends itself to integrated auditing; that is, one sample of documents may be used to audit a number of different operations involved in off-base shipments.

Universe, Sampling Frame, Elementary Sampling Unit

With the audit objective in mind, it was decided that the off-base shipment vouchers would provide the best source of information desired. The total number of vouchers processed during the month of February at each depot, therefore, constituted the "universe" from which a sample was to be drawn. For optimum results, the selection of a sample should be made, wherever practical, by using a control record; in this case the voucher register was employed. (A controlled list or register used as the basis for selecting a sample is referred to as the "sampling frame.")

Shipment vouchers generally do not contain many line items. However, to simplify the work further, the audit was limited to the first line item shown on each voucher (referred to as the "elementary sampling unit").

Items Audited

The number of transactions involved in off-base shipments are many. For reasons of practicality, only 11 items were designated for testing (e.g., extent of back orders, extent of missing records, discrepancies in unit prices, etc.). These fell into three broad categories: over-all supply efficiency, procedural accuracy in processing shipping documents, and accuracy of related monetary records.

Sampling Plan

A sample may be selected by various methods. One method involves the use of some mechanical device, like a table of random digits, to determine *each* unit or item for the sample. Such a method is called unrestricted or simple random selection, because each item remaining in the universe has an equal probability of being selected. At times this can turn out to be a cumbersome and lengthy procedure. To eliminate such difficulties the auditor may use a method which was used in this audit, namely, systematic or

interval selection following a random start. In systematic sampling, the starting point is first determined at random, and each succeeding record is determined by applying a fixed or systematic interval, such as every 12th or 59th or 100th record, and so on.

A word of caution about systematic random sampling: it should be used only when the assignment of serial numbers or other forms of identification has been made for control purposes. There can be no special meaning, classification, or interpretation associated with any of the numbers or identification symbols assigned to records in a given universe, such as assigning numbers ending in "00" or "1" to certain types of equipment or categories of personnel in order to facilitate identification. For example, if an auditor decides to select every 50th pay record in a series in which supervisory personnel have been assigned numbers ending in "1," his sample will include no record applicable to supervisory personnel if his random start does not end in "1" and would consist exclusively of supervisory personnel if the random start did end in "1." Either situation is bad from the auditor's point of view. In the case at hand, voucher numbers were assigned in a random manner with respect to the items being audited (back orders, unit price, etc.). Therefore, this systematic sample is equivalent to, and was evaluated as, a sample selected in an unrestricted or simple random manner. The actual selection procedures followed in this case are summarized in the following illustration:

Step 1—Determine the total number of vouchers (universe) processed during February, 1957, by observing the beginning and ending serial or identification numbers assigned. For example, the first voucher number is 3,756,926 and the last voucher number is 3,854,051. Since the voucher numbers are inclusive this indicated 97,126 vouchers processed.

Step 2—Compute the fixed or systematic interval by dividing the number of vouchers in the universe (97,126) by the sample size (224), viz., $97{,}126 \div 224 = 433$. In order to insure obtaining as a minimum the indicated sample size, always drop fractions.

Step 3—Using a table of random digits, select a number at random between 1 and 433. The table given here is an extract from the "Table of 105,000 Random Decimal Digits," prepared by the Interstate Commerce Commission Bureau of Transport Economics and Statistics, December 6, 1955. For example, the middle 3 digits

of line number 739, column 13 (determined arbitrarily), of the table of random digits are "052"; hence the random starting point is the 52nd voucher.

Line Number	*Col. 12*	*Col. 13*	*Col. 14*
736	12267	96360	43459
737	87633	71914	52038
738	03803	29671	74165
739	06546	00521	50286
740	04635	78350	53233

Step 4—Add to the last voucher number processed in January (the preceding month), 3,756,925, the random number, 52, selected in Step 3. This total becomes the number of the first voucher to be drawn in the sample, viz., 3,756,925 + 52 = 3,756,977.

Step 5—Determine the number of the *second* voucher to be included in the sample by adding the fixed systematic interval, 433, to the number of the *first* voucher, 3,756,977, selected for the sample, viz., 3,756,977 + 433 = 3,757,410.

Step 6—Determine the number of the *third* voucher for the sample by adding the systematic interval, 433, to the number of the *second* voucher, 3,757,410, in the sample. This step is repeated until the entire sample of voucher numbers are listed.

All the serial numbers of the vouchers for the sample may be obtained quickly by using an adding machine with a paper tape and taking subtotals after each addition. Thus:

	3,756,925	*
	52	
First voucher number	3,756,977	S
	433	
Second voucher number	3,757,410	S
	433	
Third voucher number	3,757,843	S
	433	
Fourth voucher number	3,758,276	S
	433	
Fifth voucher number	3,758,709	S
etc.		

In the illustration described above, identification numbers were assigned to the shipment vouchers in one unbroken series, making it easy to use systematic selection with a random start. However, with little or no modification, this sampling method was used very effectively even in situations where serial numbers were assigned in blocks or in a broken series, as well as some cases where no numbers at all have been assigned.

Sample Size

An important feature of any sampling plan is the determination of the appropriate sample size. This involves consideration of a number of factors:

1. *Desired quality of results.* Data obtained from a sample may not be exactly the same as in the universe. Minor variations, by virtue of sampling, are expected to occur. The auditor always wants to sample sufficiently to produce representative results. It is obvious that, everything else being equal, the larger the sample the better it represents the universe. However, since the auditor's time and resources available for any specific audit are not unlimited, he must determine in each case the optimum levels of accuracy and reliability of results consistent with available manpower and cost. In this case, it was decided that sample results were desired such that the estimated error rates would not differ from the true error rates by more than three percentage points in nineteen times out of twenty.

2. *Expected maximum error or deficiency rates.* For this application, the maximum error rate expected for each area was 5 per cent and was based on the considered judgment of a number of auditors in the field. This type of information is obtained from past experience, the considered judgment of auditors, or on the basis of preliminary tests using small samples. In the absence of prior factual experience and from the standpoint of getting more reliable audit information, it is conservative to overestimate rather than underestimate the expected error or deficiency rate. (That is why this paragraph is headed "Expected maximum . . . .") Overestimating will result in a sample size which may be larger than

required, based on the prescribed standards of accuracy and reliability. Everything else being equal and in the absence of urgent overriding practical considerations (such as severe time or personnel limitations), a larger sample improves the quality of results and provides more information for evaluation, as well as for determination of more appropriate future sample sizes.

3. *Size of universe.* This factor is important only when the sample is expected to exceed 5 per cent of the universe. Where the sample required is over 5 per cent of the universe, a special "finite population correction factor" is introduced. (An exact figure as to the size of the universe is not essential—a reasonable approximation is satisfactory.) The effect of the finite population correction factor on sample size may be illustrated by an elaboration of the example cited previously.

a. Assume a universe of 5000 where the deficiency rate is not expected to exceed 10 per cent; the desired accuracy for the sample result is such that it will not differ from the rate in the universe by more than three percentage points (± 3 per cent) in 19 times out of 20. The appropriate sample size is 357.

b. In a universe of 50,000, under the same conditions, the appropriate sample size is 381.

c. In a much larger universe, exceeding 100,000 under the same conditions, the sample size is 384.

Thus, we note only a negligible increase in sample size compared to the large increases in the sizes of the universes. This should dispel the notion that the sample size varies in direct proportion to the universe size. The net result of this common assumption is to oversample from large universes (uneconomical) and to undersample from small universes (inadequate results).

For this application it was apparent that the sample would be considerably less than 5 per cent of the universe (the universe at depots ranged from 12,000 to 232,000 vouchers); therefore, the finite population correction factor was ignored. The appropriate sample size for an expected error rate not to exceed 5 per cent, which would not vary from the actual rate by more than ± 3 per cent, in 19 times out of 20, was 203 vouchers for each installation. (This was raised to 224 vouchers per depot in order to make

maximum use of time allotted for this audit and to improve the quality of sample results, if only slightly.)[4]

4. *Practical considerations.* This element is extremely important and should not be minimized. Personnel, time, and other overriding considerations affect every phase of the sampling process—desired accuracy, reliability of results, sample size, and extent of detailed review and analysis.

Presentation of Results

Having obtained the desired audit information, there were the problems of how best to evaluate the findings and present the results. With the aim of avoiding a stereotyped approach, an effective use of the narrative, as well as tabular and graphic methods of presentation, was developed. The error rates and confidence intervals used in the audit reports were readily computed by the auditor at each installation. As previously indicated, no technical training was required; the centrally prepared worksheets included the necessary detailed instructions.

Orientation and Training

There is an important phase of any sampling plan, which may not come in for its proper share of attention, particularly during the early stages, viz., the orientation and training of headquarters and field personnel. Apart from the new methods and principles involved, we were confronted with problems such as preconceived

[4]For readers who are interested in the relatively simple mathematical computations for determining sample sizes where the "finite population correction factor" may be ignored, the following data is given both in words and in formula:

a. (In words) Sample size $= \dfrac{\left\{\begin{matrix}\text{factor of}\\ \text{assurance}\end{matrix}\right\}^2 \left\{\begin{matrix}\text{expected}\\ \text{error rate}\end{matrix}\right\} \left\{\begin{matrix}\text{1.00 minus expected}\\ \text{error rate}\end{matrix}\right\}}{(\text{measure of precision})^2}$

b. (Formula) $n = \dfrac{Z^2\, p\, (1-p)}{d^2}$,

where:

$Z = 1.96$ (appropriate factor for 95% degree of assurance),

$p = .05$ (expected maximum error rate),

$d = \pm .03$ (the measure of precision, or the maximum variation between sample and universe error rates provided sample rate does not exceed .05).

c. (Solution) $n = \dfrac{(1.96)^2\,(.05)\,(.95)}{(.03)^2} = \dfrac{3.8416\,(.0475)}{.0009} = 203.$

However, prepared tables of sample sizes, which eliminate the need for any computations, are available in Arkin, *op. cit.*

notions and resistance to change. To overcome these difficulties and to provide maximum orientation, meetings and training sessions were held for the depot auditors during the preparatory period. The installations were visited by trained supervisors to conduct the training sessions and were visited again during the early stages of the actual audit work to provide timely advice and assistance to the field auditors.

Co-ordination with Field Personnel

Between planning and implementation, a number of additional steps were required. Although preliminary plans were drawn up at headquarters in Washington and served as the starting point in the process, material changes in plans and procedures (and these were many), as well as adoption of a final program, depended largely upon the suggestions and experience of field personnel. The assistance of field personnel was invaluable and was solicited and depended upon throughout the drafting process. As a matter of fact, each phase of the plan was discussed in detail with interested field personnel and completely field tested for practicability, clarity, and reasonableness of objective. Worksheets, uniform and specific terms of reference, definition of errors, and detailed instructions were compiled at headquarters, with the close co-operation of, and co-ordination with, key field personnel.

Conclusions

The final evaluation of this audit program points to a number of significant conclusions.

1. The audit objectives were fulfilled.

2. Audit reports were improved; in fact, they tended to highlight hitherto unexplored areas. For example, prior to this audit the general consensus among auditors was that "back-order" rates (as well as other deficiencies) were negligible (5 per cent at most) and therefore this area was seldom emphasized in previous audit programs. However, this audit revealed back-order rates in the samples that ranged from 3.2 per cent to 31.4 per cent, with most of them far exceeding 5 per cent. This indicates conditions warranting continued attention.

3. Scientific discipline throughout the program produced uniform meaningful results. This provided a sound basis for deter-

mining definitive error and deficiency rates, for making a significant comparative analysis, and for consolidation into an over-all summary.

4. Comparatively small samples may be very efficient and economical. There were some who doubted the validity of a sample of only 224, from universes which ranged from 12,000 to 232,000 vouchers. Increased sample sizes merely confirmed the original findings.

5. Field testing is vital, and no comprehensive centrally directed audit program can be effectively implemented without field testing and continuous co-ordination with field personnel.

6. The principles and procedures of statistical sampling were readily understood and, once understood, very well received.

7. Statistical sampling assists materially in the integrated audit approach.

8. Larger installations do not necessarily require significantly more time and personnel than smaller installations in any specified audit area where statistical sampling is employed.

In view of the important role played by field personnel in each phase of the sampling process, planning, designing, and implementation, it is fitting that we conclude this discussion with some of the typical comments received from the auditors who were actively involved in this program:

a. "...definitely increased confidence factor available to the auditor."

b. "...provides for a better basis for substantiating conclusions stated in the audit report."

c. "...findings from this comparatively small test corroborated conclusions of prior tests which were obtained from considerably larger sample sizes."

d. "...gives more support to audit findings....Regardless of who draws the sample the results will be similar."

John L. Carey

Expanding Role of the Accountant

Accountants in government, business, and public practice have a common interest in the development of accounting as an important function in our economy. Each accountant can make his best contribution if he has a clear understanding of how he fits into the whole field of accounting and what is the probable future course of its development.

The author discusses the evolution and functions of accounting, the CPA certificate, and the need for co-operative effort by all kinds of accountants and the major accounting organizations to meet the needs of the American economy now and in the future. His comments reflect the current thinking of the Committee on Long-range Objectives of the American Institute of Certified Public Accountants.

This speech was presented at a joint meeting of the Washington Chapter and the District of Columbia Institute of Certified Public Accountants on February 13, 1958. Mr. Carey is the Executive Director of the American Institute of Certified Public Accountants.

IT seems to me that this occasion is important. For the first time, the certified public accountants of the District and the Federal Government Accountants Association are joining together in a dinner meeting. The implications are extremely interesting. Certified public accountants and government accountants evidently think they have something in common. I believe they are right

and that this joining together is a good thing. In fact, as I hope to demonstrate, I think all accountants have a great deal in common.

One of the things we have in common is an active interest in the effective use of accounting in the federal government for many purposes. The District Institute of Certified Public Accountants, the Federal Government Accountants Association, and the American Institute of Certified Public Accountants, all have an active interest in this field. But even more pervasive is our common interest in the development of accounting as a whole—as an important function in our economy.

THE GROWTH OF ACCOUNTING

Almost everyone associated with accounting, no matter how or where, must be conscious that the role of accounting has been expanding rapidly. When I joined the staff of the Institute in 1925, there were about 2,000 members. The staff was about 20 persons. The circulation of the *Journal of Accountancy* was about 10,000. Thirty-three years later, membership is over 31,000 (more than half of all CPA's in the country); the headquarters staff, 125; the circulation of the *Journal,* 89,500. All the accounting organizations show similar rapid growth. The growth of the Federal Government Accountants Association has been phenomenal.

So we know that we are growing—but do we know *where* we're growing? Do we see clearly a logical pattern of progress in which all the different kinds of accountants have their proper place? Are we planning for co-ordination of the various types of accounting services, improvement of standards and personnel, so that business and government will get the services they will require at reasonable cost? I have an uncomfortable feeling that, as their numbers grow larger, the various groups within the accounting family tend to drift apart, become preoccupied with their own relatively narrow spheres, and ignore developments in the other areas. (That's one reason why I applaud this meeting.)

THE CPA VIEWPOINT

Naturally, in view of my personal experience, I have to view the accounting scene from the standpoint of the certified public accountant. So let's start from there and see what the picture looks like.

The scope of services rendered by certified public accountants has broadened rapidly. CPA's have assumed greater responsibilities and have become more widely recognized. CPA's are realizing more clearly how complex are their relationships with government, and business, and labor, and the community at large. CPA's today are not only auditors, but analysts, advisers, and representatives. They do things in the public practice of accounting which other persons are doing as employees of corporations or government. Some CPA's may leave public practice and become employees of business or government. Even in the field of "public practice" CPA's see others doing some of the same things they do.

Many certified public accountants are puzzled by all this. With expansion in every phase of accounting, they are asking, "Where did we come from, and where are we going? What is our proper relationship, as CPA's, to other accountants? What are *our* special responsibilities as CPA's, and how do we fit into the jigsaw puzzle?" Every accountant, certified or not, is probably asking himself the same questions. Each individual knows that he can make the best contribution, within his own limitations, if he has a clear understanding of how he fits into the whole field of accounting and what is the probable future course of development of accounting in our society.

THE EVOLUTION OF ACCOUNTING

In attempting to analyze any situation, it pays to look back and see how it got to be what it is. The historical evolution of the accounting profession shows quite clearly its close relationship to the evolution of the economic affairs of mankind.

There is evidence that in the earliest human civilization, accounting was known and practiced. This was, of course, accounting in its most elementary form—simple record-keeping or bookkeeping. As civilization spread, nations were formed, some of which expanded through military conquests and developed highly organized governments which dominated the economic affairs of the subject peoples. In this environment accounting became an administrative tool—a method of control and communication—as shown in the payroll accounts of the Roman armies or in financial reports of the governor of a province to the king or emperor, who theoretically owned everything.

As trade expanded with the development of seagoing vessels, debtor and creditor relationships became important, and bookkeeping became more and more refined, until in the fifteenth century the famous Italian monk, Pacioli, put together what had been discovered up to that time in a book expounding the theory of double-entry bookkeeping. This made it possible to develop financial statements showing financial position and results of operations for a period as one integrated whole.

Up to this time an accountant was an anonymous type, without any special title, who worked at accounting, at a higher or lower level, with greater or less skill, for the most part as an employee. *Then something new and different appeared.*

The industrial revolution in England in the eighteenth century greatly intensified the need for aggregations of capital to provide machinery. This led to the invention in England of the "limited company", which became the modern corporation. From this, in turn, arose the concept of "accountability" of management to stockholders. Accounting in the sense of financial reporting, often called an "account of stewardship," became written into the law as a legal requirement.

About the middle of the nineteenth century it was recognized that economic affairs were growing in complexity and therefore that accounting and financial reporting were matters requiring expert knowledge. It seemed proper that stockholders should have the protection of an independent, objective review of the management's report on what it had done with their money. The idea of independent audit gained general acceptance.

This was, I believe, the first occasion in history when the accountant, acting as an independent auditor, was recognized as accepting *a special responsibility to outsiders apart from that of the owner or the manager of the business itself.* It was undoubtedly this new responsibility which led to the rapid development, first in Scotland and then in England, of the Institutes of Chartered Accountants under authority of royal charter. Examinations were conducted to test the competence of those who would become chartered accountants, and ethical principles were developed to strengthen their independence. Here the concepts of *professional*

competence and responsibility in accounting, as distinguished from technical skill alone, were first given tangible form.

In the latter part of the nineteenth century, when industrialization of the United States began in earnest, many Scottish and English chartered accountants came to this country on professional business for British capitalists. Many chartered accountants decided to make their homes here. They helped organize an accounting profession in the United States, with the advantage of a half-century of experience in the United Kingdom. The first certified public accountant law was enacted in New York in 1896. It was an American adaptation of the British pattern.

The CPA examinations, and the rules of ethics of the CPA societies, have shown from the beginning that the major concern was to establish a high standard of competence and responsibility for accountants who were holding themselves out as independent *auditors*—that is, who assumed responsibility, apart from that of management itself, for the fairness of management's representations to stockholders or creditors. To put it another way, it seems that the certified public accountant was intended to be a kind of "quasi-judicial accountant," whom the state certified as competent to add *credibility* to financial statements in the eyes of outsiders who had a financial interest in the business.

FUNCTIONS OF ACCOUNTING

This brief, and highly oversimplified, historical review may help to clarify the functions of accounting, and therefore of accountants. There appear to be four basic functions: record-keeping—that is, bookkeeping—which is prerequisite to all the other functions; administrative accounting, as in controlling and planning, for purposes of management; financial reporting, which includes the discharge of "accountability" to persons outside the business itself; and auditing, which includes the expression of an opinion adding credibility to financial statements, and the assumption of responsibility apart from that of the management itself.

As we have seen, it was the emergence of this fourth function, independent auditing, which led to the formal organization of an accounting *profession* first in Great Britain, as exemplified by

the chartered accountants, and then in the United States, as exemplified by the certified public accountants.

WHAT IS A PROFESSION?

Having used the word "profession" several times, I'd better stop for a moment and explain what I mean by it, because this point is important to our discussion. The word profession is very broadly used. Many groups today refer to themselves as belonging to a profession without much consideration of its precise meaning. There are all sorts of definitions of "profession," for various special purposes, such as, for example, the one given in the Wage and Hour Law. The Commission on Standards of Education and Experience for Certified Public Accountants, in testing the professional status of CPA's, adopted a very rigorous definition derived from the famous Flexner Report on medical education in 1910. This definition states the following as essential ingredients of a profession:

1. A body of specialized knowledge.
2. A recognized educational process for acquiring the requisite specialized knowledge.
3. A standard of professional qualifications governing admission to the profession.
4. A standard of conduct governing the relationships of the practitioner with clients, colleagues and the public.
5. Formal recognition of status.
6. An acceptance of the social responsibility inherent in an occupation endowed with public interest.
7. An organization devoted to the advancement of the social obligation, as distinct from the economic interest, of the group.

It seems quite clear that certified public accountants in public practice meet all these tests. They have acquired a body of specialized knowledge in accounting and auditing. They have, for the most part, passed through the recognized educational process for acquiring this knowledge at the colleges and universities. They have passed the Uniform CPA Examination, which constitutes a standard governing admission to the profession. They are subject to a standard of conduct in the form of a code of ethics. They have received formal recognition of status under the state CPA laws

through the issuance of their certificates. They have accepted social responsibility in that, as auditors, they assume an independent responsibility, apart from that of the management of the business whose accounts are under review. And, in the American Institute of Certified Public Accountants, they have an organization devoted to the advancement of the social obligation of the group.

The formal recognition of status involved in granting the CPA certificate itself, by state governmental authorities under statutory authorization, is an act involving the exercise of the police power of the state. This is justified only as it contributes to the public welfare. Underlying the exercise of this power by the state has been the historical assumption that it is in the public interest to identify professionally competent and responsible accountants who are offering their services generally to the public and on whose opinions people may rely in investing, extending credit, or making other financial decisions.

Now I come to some conclusions which are controversial, and I must make it clear that I am not speaking officially for the Institute. There are differences of opinion, and on some of these questions the Institute has not yet made up its collective mind. But what I say does reflect the current thinking of the Committee on Long-range Objectives, which has been studying these questions for two years.

WHAT IS THE CPA CERTIFICATE?

I think we are bound to conclude that the certified public accountant certificate is a kind of *license,* rather than a kind of *degree,* as it is often called. To be sure, it is issued only after passage of a two-and-one-half-day written examination testing an advanced knowledge of accounting and auditing. But what the certificate actually does is *permit* (license) the CPA to hold himself out as competent to render services to the public generally. I do not think it can be argued with much force that the CPA certificate resembles an academic degree, since in most states it is not evidence of formal study of accounting. The CPA certificate is a kind of license, a symbol that the holder has satisfied basic requirements—presumably the minimum requirements which the state believes necessary for protection of the public in the circum-

stances. Thus the CPA certificate resembles a license to practice medicine, or admission to the bar, rather than a Master of Arts or a Doctor of Philosophy degree. No such license means that the holder is necessarily qualified to do *every* kind of work in the field of his vocation, nor does it mean necessarily that he has acquired complete mastery of *any* branch of knowledge in that field. A Ph.D. in accounting issued by a university of high standing might well signify knowledge in the particular field of specialization superior to that which the certified public accountant certificate signifies.

CPA NOT NECESSARILY "SUPERIOR"

Obviously this does not mean that the certified public accountant is necessarily *superior* to other accountants. There are undoubtedly accountants in government, in industry, and in academic circles who may know more about *some* phases of accounting than any certified public accountant does, and may know more about *most* phases of accounting than some certified public accountants do. But the CPA has demonstrated the basic qualifications for the professional function of adding "credibility" to financial representations—and this requires a comprehensive knowledge of all phases of accounting and auditing.

EXPERIENCE FOR CPA CERTIFICATE

I do not intend anything I have said to suggest any conclusion on the highly controversial question of whether experience in government accounting or in industrial accounting should be accepted as satisfying one of the prerequisites for the certified public accountant certificate. Nothing I have said precludes, on logical grounds, the possibility of accepting any type of experience that tends to demonstrate qualifications for the public practice of accounting. Presumably this would include competence to add *credibility* to financial representations, which, as we have seen, is the characteristic "professional" function. To be sure, some CPA's feel that only public accounting experience can do this; but others believe that certain types of accounting experience in other areas are equally acceptable; and not a few believe that, if academic attainments are sufficient, no experience at all should be required for admission to the examination.

The District of Columbia Institute of Certified Public Account-

ants, I understand, is attempting to devise a formula, in conjunction with proposed CPA legislation for the District, to evaluate government experience offered as the equivalent of public practice. The American Institute certainly has no reason to discourage this experiment, and in fact, is watching it with great interest.

THE NONPRACTICING CPA

No one should misunderstand what I have said to suggest that a CPA employed by business or government ceases to be a member of the profession. His certificate qualifies him to practice public accounting as a professional man. If he chooses not to exercise that right, but accepts private employment, I do not think he leaves the profession. He is still recognized as qualified and remains as much a member of the profession as anyone else.

THE CPA

We may conclude, therefore, that the certified public accountant is a person who has been (1) *accredited* by the state to practice accounting (2) *professionally,* in the sense of holding himself out to the public as competent to accept (3) *responsibility* for adding (4) *credibility* to financial statements.

THE ONENESS OF ACCOUNTING

Having identified the CPA for what he is, no more and no less, some of the things that have puzzled us become easier to understand. There is only one function which it can logically be argued that *no one but a CPA* should perform. This function is the independent auditing of financial statements and the expression of opinion as to the fairness thereof. (In actual practice even this function is not legally restricted to CPAs, but the Institute believes that in the public interest it eventually should be.)

However, in qualifying himself to perform this function, the certified public accountant must thoroughly understand bookkeeping, administrative accounting, the preparation of financial statements, and the technique of auditing. He doesn't claim to know more about every phase of these subjects than many people who are not certified public accountants, but he does have to understand them thoroughly, or he would not be able to perform his unique function of independent auditing.

Since he understands bookkeeping, administrative accounting, financial reporting, and auditing techniques, he is able to help his clients in a multitude of ways—from bookkeeping to management advice—to the extent that his personal abilities and inclinations permit. As an individual, he may specialize in areas of accounting practice far removed from independent auditing. His own peculiar talents or personal preferences may make him accept a position in industry or government rather than continuing his practice. (This is also common among lawyers.) So it is not surprising that more and more we find certified public accountants working in industry and in government side by side with other accountants, sometimes under the direction and supervision of accountants who are not CPA's.

Likewise, it ceases to be surprising that even in what may be called the "general public practice of accounting"—the offering of accounting services to the public generally—the certified public accountant has no monopoly. He may, if he chooses, and if requested to do so, render bookkeeping services, though he can not very well contend that this is "professional" work. He may install accounting systems and improve internal control. He may prepare financial statements of all sorts, including tax returns, without expressing any opinion for the use of third parties. He may help clients in budgeting, cost control, and a host of other things. But it is hard to see how certified public accountants can claim exclusive privileges in these fields. Other people are doing this work, too, and everything we know so far indicates that they will continue to do it. Public bookkeepers and tax consultants, noncertified public accountants, management consultants, and lawyers do some of the things that some certified public accountants also do.

We must face the fact that there is a great deal of accounting work which business and government need to have done which actually does not require the peculiar qualifications of a certified public accountant. Large organizations may have much of this work done by full-time employees. Smaller organizations may have it done by independent practitioners. For some of it CPA's may be best qualified, but some of this work may be done competently by independent contractors who are not qualified as professional accountants. However, it should be clearly under-

stood that such persons have not demonstrated professional competence and responsibility, which are the basis for adding *credibility* to representations.

For example, the Treasury Department has always maintained standards of professional competence and responsibility for enrolment to practice before the Department; that is, to represent taxpayers in settlements of tax liability with the Internal Revenue Service. Lawyers and CPA's are enrolled on the basis of professional status. Others have been required to pass a written examination for enrolment. However, anyone, whether enrolled or not, has been permitted to assist taxpayers in preparation of returns. Now the National Society of Public Accountants is asking modification of the requirements so as to permit enrolment of noncertified public accountants merely on showing of good character and a certain amount of experience. It's an interesting question whether *representation* of taxpayers is an area in which professional standards of competence and responsibility should be maintained.

Now I want to come to the main point. No matter how many different kinds of people are doing accounting work, no matter how many the titles by which they describe themselves, no matter whether the work is done in professional practice or in government or in industry, there is a *oneness* in the accounting function as a whole that cannot be denied.

Every accounting function is closely related to every other, whether it be under the general classification of bookkeeping, administrative accounting and control, financial reporting, or auditing. The work can be divided among different people with different degrees of competence or specialization. But the accounting function itself is naturally an integrated whole that cannot properly be fragmented or divided into watertight compartments. (That's another reason why meetings like this are good.)

If any part of the accounting function breaks down, all other parts will be adversely affected. If any group of accountants is discredited, all others suffer to some extent.

FEDERAL GOVERNMENT ACCOUNTING

An excellent illustration of the "oneness" of accounting, and the interrelation of all its parts, is modern accounting within the United States government.

Prior to the 1930's, few people cared very much about how the government handled its accounting. The federal budget was less than $4 billion in 1929; the total income-tax revenue less than $3 billion. Private enterprise was running the economy. Accounting for private enterprise was getting about all the attention that anybody was giving accounting in any of its phases.

But in the thirties the federal government began to become a mighty economic force. Not only did government agencies begin to make rules which required private business to keep accounts and make financial reports, but the government began to go into business itself, and to lend money, and to guarantee or insure certain types of private financial transactions. And in the late thirties, with war looming ahead, the government became the biggest single customer of many private businesses. Since World War II the United States Government, in all its activities, including the government corporations, has become the biggest business in the world. It proposes to spend in fiscal 1959, $73.9 billion. It employs millions of people. The federal government has vital influence over the economic well-being of the entire population of the country.

Fortunately for all of us, some accountants in the 1930's began to pay attention to federal government accounting, which was at that time admittedly obsolete. Largely as a result of the interest of a few men, some of whom, I am proud to say, happened to be certified public accountants, things began to improve. Legislation was enacted to permit improvements. The concept of commercial-type auditing was introduced into the General Accounting Office. A start was made in improving and co-ordinating the processes of budgeting, accounting, and auditing. The first and second Hoover Commission Reports, in which many distinguished accountants participated, helped the movement along. Nearly ten years ago, a joint program to improve accounting in the federal government, sponsored by the Secretary of the Treasury, the Director of the Bureau of the Budget, and the Comptroller General of the United States, was initiated. The ninth annual progress report under the joint program shows that progress is continuing at a rapid rate.

The federal government is developing accounting as an administrative tool in the areas of accrual accounting; cost-based budget-

ing; synchronizing of programming, budgeting, accounting, and reporting; improved organization for financial management; establishment of internal audit; and simplification of fiscal procedures. Where is there a more vivid illustration of the relation of each part of accounting to the other parts—the "oneness" of accounting?

GOVERNMENT'S "EXTERNAL" USES OF ACCOUNTING

In its external relations with the private enterprise economy, the government also demonstrates the wide variety of uses of accounting in auditing. For example, the Interstate Commerce Commission prescribes the accounting procedures to be followed by common carriers for pricing (rate-making) purposes. The SEC maintains financial-reporting standards and requires independent audits of registered corporations, for protection of investors. The Rural Electrification Administration requires audits of co-operatives to which it extends credit as a safeguard of government funds. The Federal Home Loan Bank Board prescribes audits, either by its own staff or by independent accountants, of federally insured savings and loan associations. The procurement agencies require presentation of cost data as a basis for determing prices of material purchased by the government and in the renegotiation of profits derived from sales to the government. The Post Office and other agencies have, on occasion, retained certified public accountants as consultants to review their own internal accounting operations. Banks and credit unions are subject to direct examination by staffs of supervisory agencies. Federal legislation is pending which might subject them, as well as employee pension and welfare funds, to independent audits.

Also worthy of mention is the income tax, which requires an accounting from most citizens and corporations. The influence of this tax on accounting methods and procedures is very great indeed.

How varied are the ways in which government uses accounting—for internal administration, for purposes of pricing, for protection of investors, creditors, workers, and consumers, for insurance, purchasing, and other contractual relationships, for enforcement of statutory requirements, and for taxation.

Private business also uses accounting for many of these purposes, in addition to its use in raising equity capital, in litigation,

and in financial planning and forecasting. In fact, government and business use accounting and auditing for so may different purposes that there may be duplication and waste of effort. There may be need of research to determine how one accounting activity may serve the greatest possible number of purposes.

CONCLUSION

How can these facts leave any doubt that the future opportunities of accountants for service to the community are virtually unlimited? The day has come, in my opinion, when every business which will survive in the competitive environment, every governmental unit, federal and local, and every nonprofit institution will find it necessary to have adequate financial records, adequate administrative accounting controls, including budgets and cost systems (no matter how simple), adequate financial reports to persons to whom the institutions are accountable, and an independent audit and certification of financial statements by certified public accountants. Enterprises subject to income tax in addition will have to have adequate accounting aids in determining taxable income and filing returns and in explaining and defending those returns when necessary.

Top management in government and business has already recognized its need for accounting advice and participation in managerial decisions and financial planning. The presence here tonight of the Deputy Director of the Budget, a CPA, is evidence of this fact.

If our economy is to be well served, organized accounting groups, such as the Federal Government Accountants Association, the District of Columbia Institute of Certified Public Accountants, and the American Institute of Certified Public Accountants, should do their best to see to it that business and government and the public have available the accounting information and advice they need at every level, from bookkeeping to top management. This means, I think, a *co-operative* effort, by all kinds of accountants, to develop systematic and orderly concepts of the scope and nature of the various accounting functions, to develop standards of competence for such functions, to encourage education at various levels and in the various aspects of accounting work, to conduct

research which will improve accounting and auditing techniques, and to inform the public of what accounting can do and where the necessary types of service can be obtained.

The American Institute is eager to strengthen its already friendly relations with the Controllers Institute of America, the National Association of Accountants, the American Accounting Association, the Institute of Internal Auditors, and the National Association of Municipal Finance Officers, as well as with your own organizations and all the state societies.

The "oneness of accounting" should be reflected in co-ordination and co-operation in the objectives and programs of the major accounting organizations, designed to meet the needs of the American economy now and in the future.

EMPLOYEE TRAINING

"The Federal Service can well take pride in its training achievements. It is highly gratifying that, despite limited resources, agencies have managed to provide extensive training for the mutual benefit of employees and Government. Our training philosophy, approach and methods are as sound and modern as those to be found anywhere.

"It is clear, however, that Government is still far from realization of the comprehensive, integrated training program required to meet its needs. I, therefore, strongly recommend that each of you, in addition to continuing the good work already being done, take special steps within the limits of the authorities and resources available to you.

"1. to strengthen long-range career development programs for professional, scientific, and technical employees.

"2. to provide active personal support to executive development efforts.

"3. to extend the scope and coverage of training for supervisors where needed.

"4. to reassess both the need for and the adequacy of training given to increase motivation and efficiency of your clerical and office workers.

"5. to consider carefully whether you have provided training facilities and resources adequate to do the job that needs to be done."

(From a White House letter by Mr. Rocco Siciliano, Special Assistant to the President, to the Heads of Departments and Agencies, dated December 11, 1957.)

Herschel C. Walling

Technical Accounting Developments

THE POSTAL POLICY ACT

A basic policy to guide the Congress in adjusting postal rates and fees from time to time has been enacted in the Postal Policy Act of 1958, approved May 27, 1958 (Public Law 85–426). One of several findings stated in the act is that

> the public interest and the increasing complexity of the social and economic fabric of the Nation require an immediate, clear, and affirmative declaration of congressional policy with respect to the activities of the postal establishment including those of a public service nature as the basis for the creation and maintenance of a sound and equitable postal-rate structure which will assure efficient service, produce adequate postal revenues, and stand the test of time.

The act declares it to be the policy of Congress that postal rates and fees shall be adjusted from time to time as may be required to produce the amount of revenue approximately equal to the total cost of operating the postal establishment less the amount deemed to be attributable to the performance of public services specified in the act. An appropriation is authorized to be made from the general fund of the Treasury to the revenues of the Post Office Department for each fiscal year for an amount equal to the total estimated expenditures for such public services.

The act also establishes general principles, standards, and related requirements with respect to the determination and allo-

cation of postal revenues and expenses to the several classes of services based, among other things, upon the value of the mail, the value of the time of delivery, and the quality and character of the service rendered in terms of priority, secrecy, security, speed of transmission, and other pertinent service factors. The Postmaster General is required to conduct a study or survey, not less often than every two years, of the expenses incurred and revenues received for each class of mail and service to determine the need for adjustment of postal rates and fees.

Public Law 85–426 also establishes a "Postal Modernization Fund" for the purpose of developing, acquiring, and placing in operation improved equipment and facilities. It also increases the postal rates and the compensation of postal employees.

SURVEY OF ADP MANPOWER REQUIREMENTS

The Bureau of the Budget has initiated a survey of the present and future manpower requirements for automatic data-processing (ADP) systems in the Government using medium- and large-scale digital computers. The survey is being made upon the recommendation of the Interagency Committee on Automatic Data Processing.

Bulletin No. 58–7, dated May 14, 1958, requests information from federal agencies to enable the Bureau of the Budget to (a) ascertain present and future personnel requirements, both civilian and military, for the operation of automatic data-processing systems within the federal government; (b) ascertain current methods used in obtaining and retaining such personnel; (c) identify desirable alternative methods of alleviating any present or anticipated shortage of automatic data-processing personnel; and (d) obtain current data on the nature and extent of the ADP personnel employment, training, and retention problems resulting from establishment and operation of automatic data-processing systems.

The information is to be supplied by the Department of Defense by July 15 and by the other agencies by June 15. The questionnaires call for information on ADP positions as of March 31, 1958, and estimated through June 30, 1963; on methods for recruiting and selection of civilian ADP personnel; on turnover of ADP personnel; and on training practices, requirements, and capabilities.

THE NEW FEDERAL MERIT PROMOTION PROGRAM

The Civil Service Commission has adopted a new government-wide merit promotion program for the competitive civil service (Departmental Circular No. 927, January 6, 1958). All promotions after January 1, 1959, must be made under this program. The new promotion program embraces such merit features as areas of consideration which are as broad as practicable; qualification standards which are at least equal to competitive standards, and evaluation methods that are reasonable, valid, and applied fairly; selection from among the best qualified; and prompt release from former positions of persons selected for promotion.

The Departmental Circular points out that the new program has been developed from elements of some of the fine systems already in existence and will act to extend the more desirable promotion practices throughout the federal service. It was developed with the assistance of agencies and employee organizations.

The new promotion program requires each agency to develop and issue promotion guidelines to its subordinate offices and to develop and issue promotion plans which apply the guidelines systematically to specific groups of positions. The Commission, through its inspection process, will review agency guidelines, plans, and promotion actions to determine their compliance with the new program.

PROTECTION FROM UNSCRUPULOUS SUBCONTRACTORS

The Comptroller General has ruled (B–131078, February 26, 1958) that a contract condition which would preclude subcontracting, except subject to determination and approval by the contracting officer of the subcontractor's qualifications to perform the work in a capable and responsible manner, is permissible under the competitive procurement system to protect the government from unscrupulous subcontractors, provided that the condition is cited in the invitation.

GAO POLICY AND PROCEDURES MANUAL

The initial edition of the *GAO Policy and Procedures Manual for Guidance of Federal Agencies* was released in September 1957.

Two of the nine titles were incomplete at that time: Title 2, Accounting Principles and Standards and Internal Auditing Guidelines, and Title 9, Accounting Forms.

Title 9 was completed in December 1957 with the issuance of facsimiles of the standard forms prescribed for general use.

Title 2 in the initial edition of the *Manual* contained Accounting Principles Memoranda Nos. 1 and 2, originally issued in 1952 and 1954. Memorandum No. 1 was a general statement of accounting principles and standards, and No. 2 was a statement on the relationship of cost and expenditure concepts in the use of accounting data. Memorandum No. 3, Accrual Accounting, and a statement on internal auditing have been added to the title. Memorandum No. 2 is now being revised and expanded to define the interrelationship of cost of work performed, accrued expenditures, obligations, and cash disbursements and to discuss the usefulness of cost data to management in accounting and budgeting. Other memoranda on property accounting are being prepared for addition to the title. Still other such supplementary principle statements are under consideration.

The remaining portion of Title 2 will consist of some thirteen chapters on federal accounting procedures. They will illustrate the application of the accounting principles and standards with charts of accounts, journal entries, exhibits, financial reports, and explanatory text material. These chapters will be illustrative rather than mandatory. They are intended as guides for agencies in designing or revising their accounting procedures and systems and as training material for financial management personnel. The following six chapters have been issued: Chapter 2000, "Accounting Procedures"; Chapter 2500, "Accounting Organization and Records"; Chapter 3500, "Classification of Accounts"; Chapter 4000, "Appropriations, Apportionments, Transfers, and Allotments"; Chapter 4500, "Obligations and Expenditures"; and Chapter 5000, "Disbursements." The remaining seven chapters are in preparation. They will deal with the classification of funds, billings and receipts, decentralized accounting, cost accounting, property accounting, adjusting and closing entries, business activities, and financial reports.

The *Manual* may be purchased from the U.S. Government

Printing Office. The price of $7.50 includes the portions yet to be issued and the changes to keep it up to date.

FACULTY VISITS TO FEDERAL INSTALLATIONS

Civil Service Commission Departmental Circular No. 935, February 25, 1958, encourages federal agencies to request appropriate college faculty members, heads of departments, and placement officers to visit their installations and activities when such travel will be of service to the government by assisting in its recruiting programs. The Circular points out that such visits would put the faculty members in a better position to advise their students about federal employment and would put the federal agencies, by getting the advice of faculty members, in a better position to develop effective recruiting programs. The federal agencies may pay the travel and subsistence expenses of college faculty members who on request perform travel for the purpose of conferring with agency officials on recruitment problems but who are not hired as experts or consultants, in accordance with a decision of the Comptroller General dated November 20, 1957 (B–134260).

ACCOUNTING TECHNICIANS

The Civil Service Commission has established a new classification series, the Accounting Technician Series GS–525–0 (Departmental Circular No. 939, March 13, 1958). This series includes all classes of positions the duties of which require the application of some knowledge and understanding of well-established principles, procedures, and techniques of accounting, but not full professional education or equivalent experience in accounting. Qualification standards for positions properly classifiable in the Accounting Technician GS–525–0 Series are being prepared by the Commission.

Book Reviews

Victor Z. Brink and James A. Cashin. *Internal Auditing*, 2d edition. New York: Ronald Press, 1958. 478 pp.

In the preface to his 1941 edition of *Internal Auditing*, Victor Z. Brink cited as its two purposes: (1) being of service to those responsible for formulating the program, directing, and performing the audit and (2) acquainting executives with the potentialities of internal audit as a device to control operations. In seventeen years, much theory has passed over the dam, with much new theory being spawned. The changed emphasis today is on the use of internal audits in managerial control (see 1957 revised Statement of the Responsibilities of the Internal Auditor). This updating is given full recognition in the revision, with the addition of an entirely new section called "Operating Activities," including chapters on sales and billing, purchasing, inventory control, payroll, production costs and cost of sales, and distribution costs—administrative and financial expenses. New areas in our 1958 business world which are given treatment include electronics and statistical sampling.

Tomorrow's machine accounting and electronic data processes promise the auditor no undue difficulty if he will but take the time to familiarize himself with machine potentials, Brink assures his readers. He cites the unfounded fears with which punched card accounting was greeted a few years back and emphasizes over and over the necessity that our profession boldly meet changed conditions while maintaining our high standards. The Internal Auditor is challenged by Dr. Brink to be in the forefront rather than the rearguard of the electronic advance. He has adopted much material (with permission, of course) from outstanding contributors to the limited library presently existing and fitted it into his over-all treatise with micromatic precision and smoothness.

The present text, exclusive of appendixes, consists of 428 pages compared with 506 in the former, but this loss in volume appears to be

amply compensated for in improved organization and clarity. The team of Brink and Cashin have revitalized the 1941 issue, insuring its continuance as the authoritative voice on proper internal audit procedure and practice. Although not conceived with government in mind (aimed as it is at corporate and industrial organizations), it serves a definite need and can be advantageously utilized in Internal Audit Divisions throughout our federal structure.

CLARK L. SIMPSON

Internal Audit Seminar
School of Business Administration
The American University

Robert M. Trueblood and Richard M. Cyert. *Sampling Techniques in Accounting.* Englewood Cliffs, N.J.: Prentice-Hall, 1957. 211 pp.

This book is an excellent introduction to statistical sampling for those who do not understand mathematical techniques. The book does not attempt to pose a solution for all of the problems of either auditing or accounting sampling methods but does give practical illustrations where these methods have been used. The authors state that "the purpose of this book is to attempt an explanation of the philosophy involved in the merger of the disciplines of accounting and statistics, and to bring together a series of case findings which should serve to encourage others to make similar inquiries into the possibilities of statistical sampling." They state, "There are three areas of interest to the accountant in considering statistical applications: clerical and accounting procedures, auditing problems, and management control techniques."

Sampling Techniques in Accounting is organized into three separate and distinct parts. Part I, comprised of three chapters, explains in simple language some of the basic principles of statistical sampling: Chapter 1, "Statistical Concepts"; Chapter 2, "Elements of Statistical Sampling"; and Chapter 3, "An Experiment Illustrating the Use of Statistical Sampling Concepts."

The authors' opinions as to the usage of statistical sampling in auditing practice and in accounting and management control are expressed in Part II: Chapter 4, "An Evaluation of Statistical Sampling Methods in Auditing Practice"; and Chapter 5, "Statistical Sampling Methods in Accounting and Management Control."

Part III consists of a series of nine chapters of unrelated case studies using statistical sampling techniques in the solution of auditing and accounting problems: Chapter 6, "Substantiation of Inventory

Amounts by Sampling of Perpetual Records"; Chapter 7, "Confirmation of Accounts Receivable in a Department Store"; Chapter 8, "Aging of Accounts Receivable in a Department Store"; Chapter 9, "Reduction of Clerical Costs in the Processing of Vendors' Invoices"; Chapter 10, "Statistical Techniques in the Control of Labor Performance"; Chapter 11, "Tests of Physical Inventory Quantities of Bulk Materials"; Chapter 12, "Sampling for LIFO Inventory Evaluation Purposes"; Chapter 13, "Acceptance Sampling in the Inspection of Department Store Billings"; and Chapter 14, "Survey of Air Force Internal Audit Procedures for Inventory." The Appendix is a bibliography on the application of statistical methods of accounting and auditing.

The first three chapters of the text give simple definitions and illustrations on survey sampling, ratio estimate, acceptance sampling, tests of hypotheses, concepts of error, and sampling for the rare item. The authors state that, in their opinion, survey sampling procedures have a more important place in auditing than acceptance sampling. While many authorities will not agree with their conclusions regarding the evaluation of statistical sampling methods in auditing practice and in accounting and management controls, given in Chapters 4 and 5, the basic ideas are sound. They suggest what can be done now in the usage of statistical techniques in auditing, what can be done in the near future, and problems which can be solved in the long run through the use of statistical techniques. Those who have any knowledge of the use of statistical techniques know that there are many areas in which statistical sampling techniques can be used to advantage. Many of these areas are pointed out by the authors.

For those readers whose activities are in accounting procedures, the authors indicate that statistical sampling is apt to be most suitable wherever masses of accounting data are involved, when such data can be stated in quantitative terms, and when conclusions based on measurement and interpretation, with somewhat less than 100 per cent accuracy, are acceptable. They point out that progress has been and will continue to be more rapid in applying statistical sampling to internal accounting procedures and to management control problems than to the more complex and subtle field of auditing.

Anyone interested in exploring the possibilities for the use of statistical sampling in accounting or auditing should find this book very interesting and helpful.

LEO HERBERT

Office of Staff Management
United States General Accounting Office

H. Edward Breen

Current Publications

BOOKS AND PAMPHLETS

American Institute of Certified Public Accountants, Committee on Accounting Procedure. *Earnings per Share.* (Accounting Research Bulletin No. 49.) New York: The Institute, April 1958. 8 pp. $0.25.

The committee reaffirms the statements and conclusions made in Accounting Research Bulletin No. 43, *Restatement and Revision of Accounting Research Bulletins* (1953), suggests general guides in computing and presenting earnings per share, and discusses earnings per share for single-year computations or earnings per share to be computed for a period of several years.

American Institute of Certified Public Accountants, Staff of the Institute. *New Ideas in Accounting.* New York: The Institute, 1958. 72 pp. $1.50.

A seventy-two page book made up of twelve major articles which appeared in the *Journal of Accountancy* during the past year. They were selected because they deal with subjects of current interest to accountants and business executives.

Bennett, Clinton W. *Standard Costs: How They Help Modern Management.* Englewood Cliffs, N. J.: Prentice-Hall, 1958. 515 pp. $8.25.

A modern, up-to-date presentation of standard costs. The organization of material is much the same as the approach that would be taken by a cost consultant in working through a firm's problems with his client. The "emphasis at all times is placed on the role of costs as important tools of management."

National Association of Accountants, Research Project Committee. *Current Practice in Accounting for Depreciation.* (Research Series No. 33.) New York: The Association, 1958. 36 pp. $1.00.

This is an important contribution by the National Association of Accountants in the field of depreciation accounting. It discloses that accounting for depreciation has been heavily influenced by federal income tax laws and regulations, and the depreciation methods employed in the accounts have generally been those elected and acceptable for income tax purposes. However, there are trends toward new thinking, and new depreciation practices seem to be emerging. This study was undertaken to ascertain what these trends are and to re-examine established depreciation accounting practices in the light of present-day conditions.

Parker Publishing Company. *Handbook for Secretaries to Accountants.* Englewood Cliffs, N. J.: Parker Publishing, 1958. 438 pp. $4.95.

This is a practical handbook for secretaries to accountants. The book was prepared by a group of the most successful secretaries to accountants, and the latest time- and work-saving techniques developed have been included.

Thomas, David A. *Accelerated Amortization.* Ann Arbor, Mich.: Bureau of Business Research, University of Michigan, 1958. 104 pp. $5.00.

"This study discusses the history and development of the use of accelerated amortization, particularly in a defense economy, as an inducement to industry to proved production facilities."

ARTICLES

American Accounting Association, 1957 Committee on Governmental Accounting, "Tentative Statement on Government Accounting," *Accounting Review,* 33 (April 1958), 209.

"Recent progress has outmoded many traditional standards of financial administration of governmental units. Among the more significant changes in concept are (1) greater recognition that financial management must be an integral part of total management at each level to be effective; (2) greater emphasis on the interrelationships of programming, budgeting, accounting and reporting, and (3) greater awareness

and acceptance of the need for variable patterns of accounting compatible with assignments of managerial responsibility and the type of operation being conducted. This proposed statement is an effort to express in broad terms the current accounting and related standards of governmental financial administration."

American Institute of Certified Public Accountants, Technical Services Department, "Opinion Survey on Price-Level Adjustment of Depreciation," *Journal of Accountancy,* 105 (April 1958), 36–43.

The Institute publishes a summary and analysis of opinions expressed by over four hundred executives and educators on the desirability of disclosing current cost of depreciation.

Browne, Dudley E., "Financial Management in a Changing Economy," *The Controller,* 26 (Feb. 1958), 68–71, 89.

Mr. Browne discusses some of the current financial problems and how financial management might view these matters. The author briefly considers the problem caused by the ever-increasing use of capital and the problems of costing and return on investment, and finally suggests that the controller take individual action in developing more adequate accounting.

Ellis, George P., "Concepts in Municipal Utility and Other Enterprise Accounting," *Municipal Finance,* 30 (May 1958), 164–172.

This article presents one method to account for municipal utilities and other enterprises, including a discussion and presentation of the information to be included in financial reports.

Hill, Henry P., "An Accountant Looks at Statistics," *Journal of Accountancy,* 105 (April 1958), 57–65.

The author "points out that the universe to be sampled by auditors is not always homogeneous, and that auditors select periods and items to be sampled on the basis of experience and judgment. He cites specific problems involved in audit sampling which cannot be resolved by the application of routine statistical sampling methods."

Hotchkiss, W. Stewart, "Financial Reporting Implications of Accounting and Electronic Data Processing," *The Controller,* 6 (April 1958), 155–158, 182.

The author discusses the use of electronic data-processing equipment in any size operation, stressing effective utilization through an integrated data-processing system and the effect of this kind of system upon reporting.

Jauchem, C. R., "Impact of Electronic Data Processing on Auditing," *N.A.A. Bulletin,* 39 (May 1958), 53–59.

The author, against a background of auditing in the federal government, presents a clear picture of the altered audit situation where there is electronic data processing, and ways of adjusting to it.

Marcus, S. Wesley, "Responsibilities in Staff Training," *Journal of Accountancy,* 105 (March 1958), 60–64.

"The staff training director of a national accounting firm outlines the program worked out by his organization to supply opportunities for its personnel to reach professional maturity."

Mautz, R. K., "The Nature and Reliability of Audit Evidence," *Journal of Accountancy,* 105 (May 1958), 40–47.

"Finding that the theory of audit evidence has not yet been comprehensively treated in accounting literature, the author discusses both the legal and accounting aspects of such problems as reliability, adequacy of sample and the validity of various kinds of evidence relied on by auditors."

Nagle, C. H., "A Method of Rating Internal Auditors," *Internal Auditor,* 15 (March 1958), 26–31.

In a highly competitive area with a shortage of professional personnel, it is imperative that a fair and objective method of evaluating the personnel be employed. "The systematic evaluation of personal performance and ability to advance is a major responsibility of the chief internal auditor. Where operations are decentralized, the problem becomes more acute." The author discusses a method of appraising performance and potential of its internal auditors that has been used with success in a large company.

Obrock, Raymond F., "A Case Study of Statistical Sampling," *Journal of Accountancy,* 105 (March 1958), 53–59.

The author describes the satisfactory results achieved by a company which had taken a 100 per cent physical inventory for five years and then replaced it with a sampling plan.

Tietjen, A. Carl, "Changes in Public Accounting," *Journal of Accountancy,* 105 (May 1958), 34–39.

The author discusses the continuing examination approach to auditing and concludes that this type of engagement can improve service to clients and aid in alleviating accountants' personnel problems at all staff levels.

Trueger, Paul M., "Review of Defense Contracts for Accountants," *The Controller,* 26 (May 1958), 222–224, 250.

"The continuing heavy impact of defense spending on industry makes it essential that accountants, as advisors to industrial managers, maintain up-to-date familiarity with defense contract requirements. This article is designed as a summary refresher of accounting aspects of defense contracts and a discussion of some of the current developments in the field."

Wright, Howard W., "Tentative Statement on Governmental Accounting," *Accounting Review,* 33 (April 1958), 210–213.

The chairman of the 1957 Committee on Governmental Accounting of the American Accounting Association discusses the "Tentative Statement on Government Accounting."

Executive Committee of the Federal Government Accountants Association

President: Harry J. Trainor, Internal Revenue Service, Washington, D.C.

First Vice-President: Emmett S. Clifford, San Francisco

Second Vice-President: Joseph G. Barkan, Maritime Administration, New York

Third Vice-President: Paul L. Appleman, Civil Service Commission, Washington, D.C.

Immediate Past President: William A. Newman, Jr., General Accounting Office, Washington, D.C.

Past President: Robert W. King, Housing and Home Finance Agency, Washington, D.C.

Executive Secretary-Treasurer: Martin C. Powers, Washington, D.C.

Chapter	*Representative*	*Agency*
Atlanta	Harry Osolin	Veterans' Administration
Baltimore	James L. Thompson	General Accounting Office
Boston	Russell B. Kelley	Air Force Auditor General
Bridgeport	Irving Friedberg	
Canal Zone	Norman B. Davison	Panama Canal Company
Chicago	Maurice Shelton	Army Audit Agency
Cincinnati	William W. Addis	Post Office Department
Cleveland	William Beckett	General Accounting Office
Dallas	James R. Martin	Post Office Department
Dayton	Stewart D. McElyea	General Accounting Office
Denver	Floyd F. Nagel	Air Force Finance Center
Detroit	Robert C. Eady	General Accounting Office
Frankfurt a/M	Thomas N. Turner	Air Force Auditor General
Kansas City	Lawrence W. Richardson	Department of Commerce
Los Angeles	Henry A. Wallace	Air Force Auditor General
Minneapolis	James T. Holliday	Post Office Department
New Orleans	Charles B. Landry	Department of Agriculture
New York	William F. Edwards	Air Force Auditor General
Omaha	T. F. Bogenreif	Strategic Air Command
Philadelphia	Harry C. Kensky	General Accounting Office
Portland	Joseph J. Pachot	Department of Interior
St. Louis	Thomas J. Coll	Army Ordnance
Salt Lake City	John M. Patton, Jr.	Department of Interior
San Antonio	Robert H. Voigt	Army Audit Agency
San Francisco	Richard Greenberg	General Services Administration
Seattle	Samuel D. Bettes	Army Audit Agency
Tokyo	Joseph A. Kooker	Air Force Auditor General
Washington	Edwin J. B. Lewis	Navy Bureau of Aeronautics